February 2021

Binder 029, Bucephalidae M-T [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

MORDVILKOVIA Pigulewsky, 1931

Elongate cylindrical, anterior end blunt, hind end smaller, rounded. Cuticula covered with small spines, Organ of attachment a rhynchus with conspicuous cuticula folds and a diameter greater than that of the body. Mouth in posterior half of body, near median line. Esophagus and intestine lie across the body near the anterior testis. Testes and ovary on same side, cirrus sac on the other/ All these organs lie in the hind half of the body. Vitellaria separated and forming paired follicles arranged in the sides of the body. Uterus with large number of coils in the anterior third of body and extending not quite to the posterior end of body. Eggs small, oval, without filament. Testes round or oval. Cirrus sac lying opposite and beside the testes, sac-like. Genital pore at hind end.

Type species: M. elongata from Esox lucius in Dnjepr.

Note: This genus seems to be very near Dollfusina vannei (Shen) Eckmann. renamed Dollfustrema by Eckman 1934

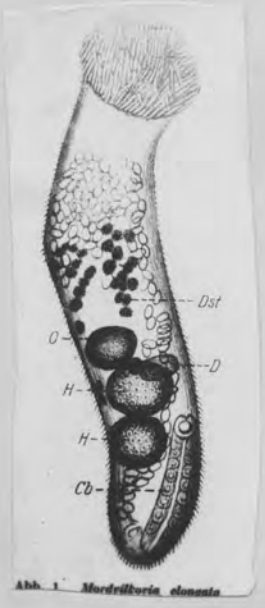


Abb. 1 Mordvilkovia elongata

Considered a synonym of Prosorhynchus by Nagaty (1937) & M. elongata a synonym of P. crucibulus (Rud.) (not correct)

considered valid by Crowcroft -1947

MYORHYNCHUS Durio & Manter, 1968

GENERIC DIAGNOSIS OF **Myorhynchus:** Bucephalidae; Prosorhynchinae. Rhynchus conical, flattened anteriorly, with ventral fold or lobe; without tentacles or suckers; strongly bilateral, muscles in paired bilateral sets, mostly diagonal or dorsoventral. Mouth near midbody; cecum directed anteriorly. Testes slightly diagonal, near midbody; cirrus sac large. Ovary far anterior, near rhynchus. Vitellaria lateral, entirely postovarian. Egg shell covered with minute spines. Type species: *M.* **pritchardae** n. sp.

DISCUSSION: This genus is related to *Prosorhynchus*, but has three distinguishing characters: (1) the complex structure of the rhynchus; (2) the location of the ovary anterior to all vitellaria; and (3) the spiny eggs.

The name *Myorhynchus* is from *myo* = muscle and *rhynchos* = snout. The species is named for Mary Hanson Pritchard, University of Nebraska.

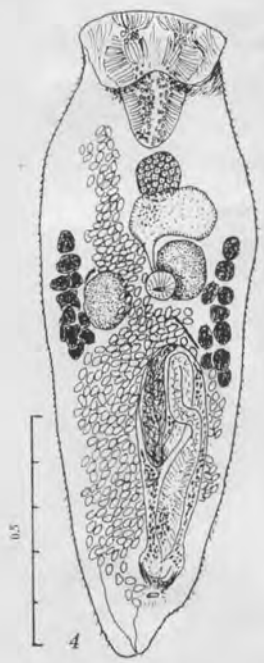
Bucephalidae

Durio & Manter, 1968

Myorhynchus pritchardae n. gen., n. sp.
(Figs. 4–6)

HOST: Serranidae; commonly called "leche."
LOCATION: Intestine.
NUMBER: One specimen.
HOLOTYPE: USNM Helm. Coll. No. 63303.
DESCRIPTION: Body elongate, broad and truncate at anterior end, more tapered posteriorly; spined, except at flat anterior surface of rhynchus. Length 1.427; greatest width, just anterior to midbody, 0.470. Rhynchus (Fig. 5) with flattened anterior surface bearing ventral flap broadly incurved at posterior edge; 0.303 long by 0.303 wide; tapering posteriorly; strongly muscular and markedly bilateral; with six pairs of muscles on each side of median line as follows: (1) at anterior end a group of short diagonal fibers; (2) a small group of dorsoventral muscles; (3) curved, more or less longitudinal muscles; (4) a long row of dorsoventral muscles extending to posterior end of rhynchus where they intergrade with (5) transverse muscles along outer side of rhynchus; (6) curved, more or less longitudinal muscles along lateral sides of rhynchus. Longitudinal fibers in middle of ventral flap of rhynchus.

Mouth median, slightly anterior to midbody; pharynx 0.066 in diameter; esophagus present; cecum anterior to pharynx, extending more or less laterally to left, broadly rounded. Testes spherical, smooth, slightly diagonal; anterior testis to left, partly dorsal to pharynx; posterior testis near midbody. Cirrus sac 0.554 long by 0.140 wide; to left of midline; anterior end near midbody, just posterior to posterior testis. Seminal vesicle straight, elongate, extending about half-length of cirrus sac; pars prostatica extending anteriorly to near base of sac, then looping back and widening to form a terminal portion lined with microvilli. One ventral and two smaller atrial lobes. Genital pore ventral, 0.118 from posterior end of body. Ovary spherical, median, far anterior, immediately posterior to rhynchus, separated from anterior testis by intestinal cecum; Mehlis' gland immediately postovarian. Vitelline follicles lateral, in two widely separated rows; 10 on right side, 13 on left; entirely posterior to ovary; mostly at testicular level. Uterus with one slender loop extending anteriorly to level of base of rhynchus; mostly to right of cirrus sac; not extending appreciably posterior to genital pore. Eggs relatively wide, 25–30 by 20–22 μ; shell covered with small spines or pointed projections (Fig. 6). Excretory pore terminal; anterior extent of vesicle not determined.



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Neidhartiinae n. subfam.

Subfamily diagnosis. — Bucephalidae: Body elongate, spinose. Rhynchus discoid or plug-shaped. Pharynx equatorial or postequatorial. Intestine rather short. Testes tandem, on one side of body, posterior testis at about level of pharynx. Cirrus pouch well developed. Ovary opposite testes or intertesticular. Vitellaria pretesticular, may be partly opposite anterior testis. Excretory vesicle tubular, of moderate length.

Key to genera of Neidhartiinae

Rhynchus discoid, ovary exactly intertesticular *Pseudoprosorhynchus*
Rhynchus unusually large, plug-shaped, ovary opposite testes ..... *Neidhartia*

Neidhartia Nagaty, 1937

Generic diagnosis. — Bucephalidae, Neidhartiinae. Body elongate, spined. Rhynchus very large, muscular, plug-shaped. Mouth postequatorial. Intestine short, directed forward from pharynx. Testes tandem, on one side of body. Cirrus pouch reaching to level of pharynx. Genital lobe present. Genital pore ventroterminal. Ovary opposite testes, on the left of digestive organ. Laurer's canal posterior to hind testis. Uterus may extend forward beyond vitellaria. Vitellaria divided into paired groups, of which one lies in front of the right testis and the other in front of the ovary. Excretory vesicle rather long, with terminal pore. Parasites of marine fishes.

Genotype: *N. neidharti* Nagaty, 1937 (Pl. 1, Fig. 12), in *Serranus* sp.; Red Sea. Also in *Belone* sp.; Bombay.

Other species:

N. ghardagae Nagaty, 1937, in *Serranus* sp.; Red Sea.
N. microrhyncha Chauhan, 1943, in *Psettodes erumei;* Bombay.
N. polydactyli Manter, 1953, in *Polydactylus plebius;* Fiji Island.

NEIDHARTIA Nagaty 1937

Body elongate, cylindrical. Cuticle spiny. Anterior end with a conical rhynchus but without tentacles or a sucker. Oral aperture simple, removed from the anterior and the posterior extremities of the body. There is no oral sucker. A muscular pharynx is present. Intestinal caecum simple and sac-shaped. Testes two and smooth contoured on the right side of the body. Cirrus sac elongated, at the posterior end and towards the left side of the body. Ovary on the left side of the body opposite the testes. Vitelline glands composed of two sets. Uterine coils extend anteriorly as well as posteriorly. Excretory vesicle simple, tubular sac opening at the posterior end.

Type species: N. neidharti Nagaty
From Serranus sp. from the Red Sea

Other species: N. ghardagae Nagaty
From Serranus sp. from the Red Sea

Diagnosis of the genus Neidhartia ~~n.g.~~ NAGATY, 1937

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From *Serranus* sp. from the Red Sea.

Other species : *N. ghardagae* ~~n.sp.~~ NAGATY, 1937
From *Serranus* sp. from the Red Sea.

This genus possesses a rhynchus like that of the genus *Prosorhynchus* Odhner, 1905. It differs from the last mentioned genus in having the ovary to the left side of the body opposite to the testes and in a plane corresponding to the space between these two gonads and anterior to the cirrus-sac. This position appears best when viewed either from the ventral or the dorsal position.

I have pleasure in calling this new genus and species after the maiden name of my wife in recognition of her ever-ready and unfailing help.

Many species were collected from *Serranus* sp. locally called "Nagil". Eight of these specimens were stained, mounted and studied. The following descripition is based on this mounted material.

These trematodes are fairly small Bucephalids, wedge-shaped, the anterior end is trunkated and broad and the posterior end rounded and narrower than the anterior end. In the fixed material most of the trematodes were bent laterally, the right side becoming concave and the left side convex. They measure 0.561 to 0.908 mm. in length and 0.149 to 0.215 mm. in maximum breadth.

Fig. 56

The cuticle is covered by spindle-shaped scales that become scarce towards the posterior end.

The anterior rostellum is very well developed in comparison to the size of the body, conical in shape, the posterior end is narrow and the anterior end broad and trunkated. The dorsal and ventral free ends are elevated to form two narrow ridges. The rhynchus measures 0.118 to 0.209 mm. in length and 0.114 to 0.19 mm. in maximum breadth in the anterior end.

The digestive system : The greatest part of this system occupies the middle third of the body length. The muscular pharynx and the oral opening are at the anterior part of the posterior third of the body. The oral opening is a simple ventral crescent-shaped slit unguarded by an oral sucker. This is followed by a well developed spherical muscular pharynx ventral to the posterior testis and to the anterior part of the cirrus sac. It measures 0.038 to 0.061 mm. in diameter antero-posteriorly and 0.038 to 0.065 mm. in diameter from side to side. In the fixed stained material the diameter from side to side was more often bigger than the antero-posterior diameter. It is interesting to note here the variation in the relative position of the oral opening and the pharynx. In three cases out of the eight examined the oral opening was ventral as well as anterior to the posterior border of the posterior testis and the muscular pharynx occupies an area corresponding to that of the middle third of the posterior testis. In three other specimens the oral opening is situated posterior to the posterior border of the posterior testis and the muscular pharynx is only partly overlapped dorsally by the posterior part of the posterior testis. In one case only the oral opening and the muscular pharynx is well posterior to the posterior testis. In an immature form the oral opening and the muscular pharynx are situated between the anterior and posterior testes. The position thus only shifts either anteriorly or more often posteriorly but not from side to side and the inner wall of the anterior part of the cirrus sac runs dorsally in the middle line of the pharynx antero-posteriorly.

The single intestinal caecum is a long narrow band with thick walls and with a very narrow lumen. It runs anteriorly to the muscular pharynx, first between the two tandem testes on one side and the ovary on the other, and

-OVER-

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-OVER-

then between the two groups of vitelline follicles. Its blind end stops short of the narrow posterior part of the anterior rostellum. The distance between the blind end of the intestinal caecum and the posterior border of the rhynchus is sometimes small and sometimes comparatively big.

The male genitalia : The two testes are smooth contoured slightly ovoid or spherical bodies situated one posterior to the other, and to one side, the right side, of the alimentary canal. They occupy the middle third as well as the anterior part of the posterior third of the body.

They are nearly of the same size, the anterior one has a longer diameter antero-posteriorly than the posterior one. The anterior testis measure 0.095 to 0.133 mm. by 0.072 to 0.099 mm. and the posterior testis measure 0.076 to 0.114 mm. by 0.068 to 0.095 mm. The first measurements being those of the antero-posterior diameter, the second the diameter from side to side. There is often a space between the anterior and the posterior testes but sometimes they may be approximated to each other or almost touch and the space between them is thus reduced to nil.

The cirrus sac is a well developed elongated organ occupying the posterior third and towards the left side of the body. Its anterior part is closely related to the beginning of the alimentary canal, to the posterior testis, and the ovary. It measures 0.209 to 0.304 mm. in length and 0.061 to 0.072 mm. in maximum breadth. The cirrus sac opens at the posterior end subterminally together with the opening of the terminal part of the uterus. The common genital atrium is a crescentic slit 0.015 to 0.084 mm. from the posterior end. The cirrus sac contains an ovoid internal vesicula seminalis placed at the anterior end of the sac. It measures 0.076 × 0.042 mm. and takes the stain deeply. This organ is followed posteriorly by the pars prostatica which takes the stain very lightly. The pars prostatica, which is a well developed muscular organ composed of two kidney-shaped lobes and tend to take the stain rather deeply joins the cirrus posteriorly. In the space between the pars prostatica and the cirrus and the wall of the cirrus sac the cells of the prostate gland cannot be very well demonstrated in the preserved specimens.

Female genitalia : The ovary is a spherical smooth contoured organ situated towards the left side of the alimentary canal and slightly overlapped on its dorsal surface towards the right side by the intestinal caecum. It is situated in the plane corresponding to the plane between the two testes. The posterior border of the ovary is overlapped on its ventral surface by the anterior part of the cirrus sac. It measures 0.076 to 0.087 mm. in its longer diameter antero-posteriorly and 0.046 to 0.065 mm. in its shorter diameter from side to side. It will then be seen from the measurements and accompanying figure that the ovary is smaller than either of the two testes. No ducts have been observed in the preserved material.

The vitelline glands are made of two sets these typically come together but in a few forms they are slightly separated into two groups. Each group is composed of follicles that number ten or twelve on either side. They are sphercial granular brownish bodies that measure about 0.027 mm. in diameter. They extend anteriorly to the posterior border of, or anterior to the posterior part of the rhynchus, let us say to about the junction of the posterior with the middle thirds of the last named organ. Posteriorly they extend to the anterior border of the anterior testis or to the anterior border of the ovary. In some as in the accompanying figure the posterior extension of the two sides of the vitelline glands is asymmetrical, the group towards the side of the ovary, extend to the anterior border of this organ. Between the two groups of follicles can be seen the anterior part as well as the blind end of the intestinal caecum. The vitelline ducts are appreciably wide and full of large brownish granules. That belonging to the side of the ovary proceeds on the dorsal surface of this organ to its posterior border where it meets the vitelline duct of the other side after making a wide bend posterior to the ovary.

The uterus occupies an area mainly anteriorly and contains comparatively few ova. Anteriorly it extends to the posterior border of the rhynchus or slightly anterior to this. It opens together with the opening of the male genital ducts at the posterior end as described above.

The ova are ovoid with golden yellowish egg shells and are operculated at the narrow pole. They measure 0.03 by 0.015 mm.

The excretory system : The excretory vesicle is a simple sac-shaped organ with its broad blind end anteriorly and its narrow end posteriorly. It extends anterior to the posterior part of the rhynchus.

Durio & Manter, 1968

BUCEPHALIDAE Poche, 1907
Neidhartia coronata n. sp.
(Figs. 1–3)

HOST: Serranidae; probably *Epinephelus* sp.

LOCATION: Intestine.

NUMBER: Eight (two immature) from one host.

HOLOTYPE: USNM Helm. Coll. No. 63302.

DESCRIPTION (based on six somewhat macerated, extended specimens): Body elongate, truncate at anterior end; most body spines lost; length 1.392–1.949; width 0.193–0.287. Rhynchus conical, flattened at anterior end, with dorsal and ventral lobe; bearing single row of spines (lost on holotype) and spine-bearing ridge (Figs. 2–3). Anterior half of rhynchus with sublongitudinal muscles curving to become almost semicircular in side view near edge; tapered part of rhynchus with large, wide, thin-walled, irregularly spaced segments (muscles).

Mouth in posterior one-fourth to one-fifth of body length; pharynx subspherical, 0.058–0.065 in diameter; intestinal cecum long, extending anteriorly almost to midbody.

Testes tandem to slightly diagonal on right side of body, slightly separated, posterior testis dorsal to pharynx. Cirrus sac 0.226–0.229 by 0.074–0.099; overlapping posterior testis; containing ovoid seminal vesicle, straight pars prostatica, and numerous prostatic cells; wall rather thick, with diagonal muscles. Genital pore ventral, near posterior end of body.

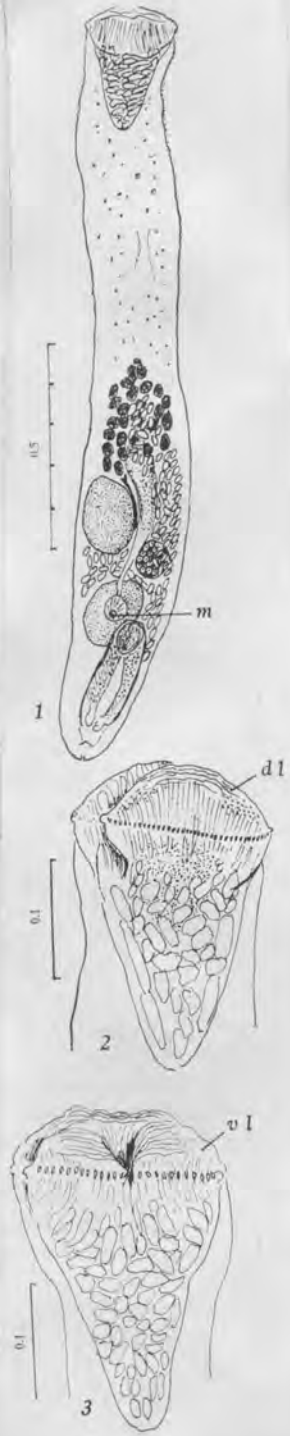
Ovary subspherical, between testes but on left side of body. Uterus not extensive, extending anteriorly to about midbody, with loop between testes, then along left side of cirrus sac. Vitellaria immediately pretesticular extending anteriorly to near midbody, forming a broad band across body; 26 follicles in holotype. Intestinal cecum and uterus extending into zone of vitellaria; uterus may extend slightly anterior to vitellaria. Eggs 33–38 by 17–22 μ. Excretory pore terminal; anterior extent of vesicle not determined.

The name *coronata* is for the ring of rhynchal spines.

DISCUSSION: The small spines on the rhynchus are easily lost but in most specimens scars indicate the ridge or row where the spines had been located.

The genus *Neidhartia* Nagaty, 1937, has been distinguished from *Prosorhynchus* Odhner, 1905, chiefly on the basis of the ovary being at the intertesticular level rather than being pretesticular or opposite the anterior testis.

The genus *Dollfustrema* Eckmann, 1934, has three to six rows of rhynchal spines, and usually an intertesticular ovary. Thus, it seems to be a near relative of *Neidhartia*. The type species of *Dollfustrema*, *D. vaneyi* (Shen, 1930), has a cone-shaped rhynchus, and the ovary may be mostly anterior to the testes. It does have a distinctive three rows of spines on the rhynchus, and the rhynchus seems to have peculiar transverse bands of muscles. All other species in the genus have a more lenticular rhynchus.



Neidhartia coronata Durio & Manter, 1968

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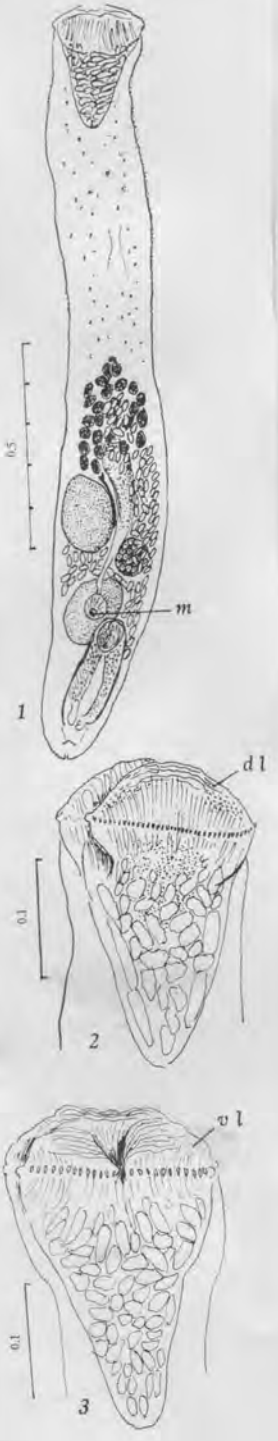
Locality: Noumea,
New Caledonia



Neidhartia ghardagae Nagaty, 1937

Size 0.625 to 1.301 by 0.169 to 0.372 mm.
Rhynchus with two lobes directed dorso-ventrally and supported by longitudinal muscle fibers. Basal portion conical, 0.172 to 0.281 mm. long and 0.148 to 0.238 mm. wide.
Mouth at junction of 3rd and 4th quarters.
Pharynx 0.059 to 0.070 mm. long; 0.078 mm. wide.
Testes tandem, to the right, in posterior half.
Cirrus sac in posterior third towards the left, 0.195 to 0.332 mm. long by 0.062 to 0.074 mm. wide. Conatins an elongated seminal vesicle, followed anteriorly by a pear-shaped organ/ lined by columnar cells, followed by the cirrus.
Ovary spherical toward the right in a plan corresponding to the space between the two testes when viewed from the dorsal or ventral surface.
Vitelline glands of two sets, meeting anteriorly separated posteriorly, anterior to anterrio testis, 7 to 14 follicles on either side
Eggs 31 by 20 u
Uterus mainly anterior to ovary.
Excretory vesicle may extend up to the conical part of the rhynchus
Host: Serranus sp.
Red Sea

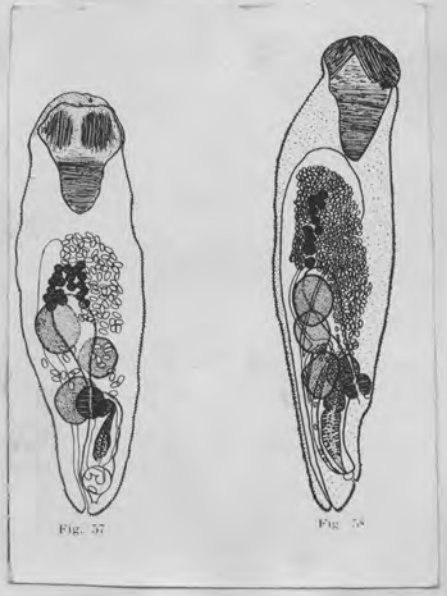


Fig. 57

Fig. 58

Neidhartia mcintoshi n. sp.
(Fig. 26) Velasquez, 1959

Host: *Epinephelus bleekeri* (Vaillant and Bocour)
Location: muscle, stomach and intestine
Locality: Malabon, Rizal, Luzon island, Philippines
Prevalence: 2 mature out of 18 from 4 of 14 hosts examined.
Type and paratype: U.S. Nat. Mus. Helm. Coll. No. 37697
Paratype: University of the Philippines, Dept. of Zoology, Helm. Coll. No. 416(1) fs.
Specific diagnosis: (Based on 2 mature and 4 immature worms). Measurements were made from 1 fairly extended specimen and 1 partly contracted mature worm. Length 0.82–1.0 by 0.25–0.26 wide. Immature worms 0.49–0.61 by 0.11–0.2. Body elongate, more or less truncate. Cuticle with minute spines. Rhynchus cone-shaped with expanded convex anterior surface; in one specimen measuring 0.17 by 0.14. Mouth at midbody; pharynx prominent but feebly muscular; intestine saccular. Testes tandem, dextral, separated by uterus and ovary. Anterior testis at level of ovary just posterior to intestine. Cirrus sac rather muscular, 0.3 by 0.09 (one specimen), about 1/3 body length; pars prostatica connected anteriorly to prominent seminal vesicle. Genital atrium fairly large; genital pore subterminal. Ovary globular, sinistral, opposite testes, but much larger. Uterus with few eggs extending anterior to posterior testis and posteriorly not beyond genital atrium. Vitelline follicles in 2 lateral rows, 12 on right and 13 on left, meeting medially in arch formation. Eggs yellowish, 26–34 microns by 17–26 microns. Excretory pore terminal. Excretory vesicle extending to rhynchus?

Discussion: There are at present 5 known species of *Neidhartia*. *N. neidharti* Nagaty, 1937, *N. ghardagae* Nagaty, 1937, *N. synodi* (Yamaguti, 1938) Manter, 1940, *N. microrhyncha* Chauhan, 1943 and *N. polydactyli* Manter, 1953. The present species occurs as metacercaria and adult in the same host, showing evidence that infection of one fish is brought about possibly through the eating of the smaller fish by the larger. The present species differs from all of the above named species in the position of the mouth and pharynx; relative size of smooth ovary and testis; the shape and less muscular nature of rhynchus; and extent of uterus. *N. synodi* (Yamaguti, 1938) Manter, 1940 does not seem to fit in the genus *Neidhartia*. Although the position of the ovary may place it in this genus, yet the rhynchus is lenticular rather than conical, as in *Neidhartia*. Manter (1953) has recognized 2 types of *Prosorhynchus*: one with an oval or lenticular rhynchus and the other conical. *Neidhartia* Nagaty, 1937 has a conical rhynchus with ovary at left. *N. synodi* (Yamaguti, 1938) Manter, 1940 has the oval or lenticular rhynchus and the ovary is dextral and in between the 2 testes. There is reason to believe that this species should belong to the genus *Prosorhynchus* on the basis of the position of the testes and the nature of the rhynchus, except that the ovary is in between the two testes and is dextral. Hence, for the present *Pseudoprosorhynchus synodi* Yamaguti, 1938 should stand as a valid species until more material is available.

Neidhartia microrhyncha Chauhan, 1943

Length 1.39 to 2.93; width 0.23 to 0.4 m
Rhynchus 0.144 to 0.23 long by 0.07 to 0.106 wide.
Mouth 0.91 to 1.84 from anterior end. Position of pharynx in relation to gonads variable, may be at level of ovary, may be at level of posterior testis, but always much anterior to cirrus sac.
Gut saccular, elongate to oval, 0.34 to 0.8 long
Gonads much anterior to cirrus sac.
Testes tandem or obliquely tandem, separated by ovary, separated from cirrus sac.
Cirrus sac small to the left near posterior end, 0.175 to 0.33 by 0.05 to 0.07 in region of cirrus, 0.068 to 0.13 wide in region of atrium.
Seminal vesicle sac-like.
Ovary intertesticular.
Vitellaria composed of two longitudinal strands of follicles, probably coming together anteriorly. Extend anteriorly to 0.47 -0.8 from anterior end. 16-17 follicles on right, 15 on left.
Uterus with a few narrow coils; no mature ova.
Excretory bladder ending slightly posterior to blind end of gut, or somewhat anterior to this, never to the rhynchus.
Host: Psettodes erumei, a marine fish
West coast of India; Bombay

Differs from N.neidharti and N.ghardagae (which Chauhan thinks might be synonymous) in elonagte shape, small cirrus sac, small rhynchus, etc.

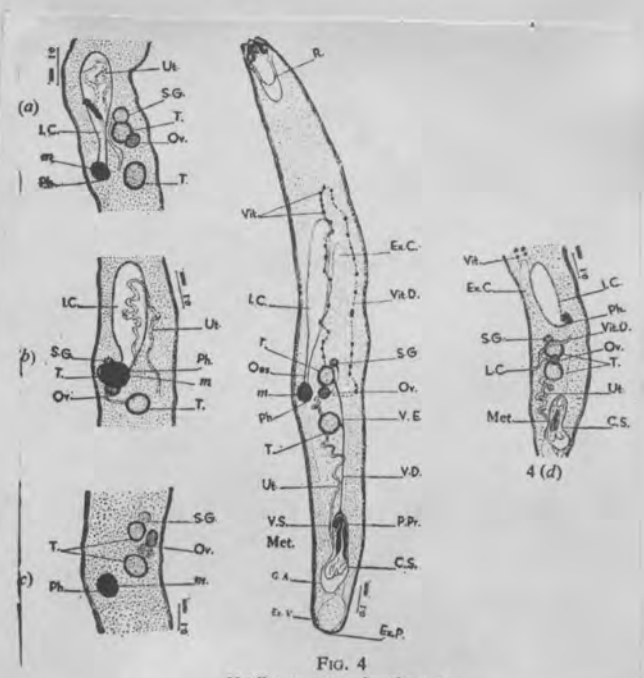


FIG. 4
Neidhartia microrhyncha n.sp.
., Oesophagus ; *R.*, Rhynchus ; *V.D.*, Vas deferens ; *V.E.*, Vasa efferentia ; Othe
t. 1.

FIG. 4 (*a*), (*b*) (*c*), and (*d*)
Variations in the relative position of gonads and digestive organs.
L.C., Laurer's canal ; other lettering as in previous figures.

NEIDHARTIA POLYDACTYLI n. Manter, 1953

(Figs. 3 and 4)

Host: *Polydactylus plebius* (Bonnaterre)*, "uculuka".

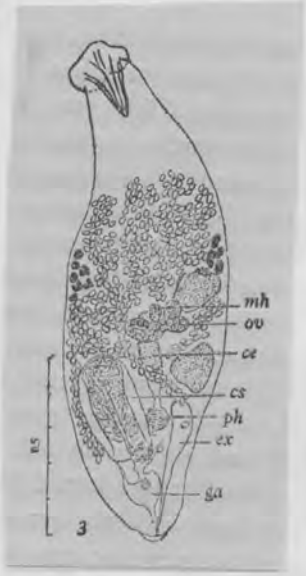
Location : intestine.

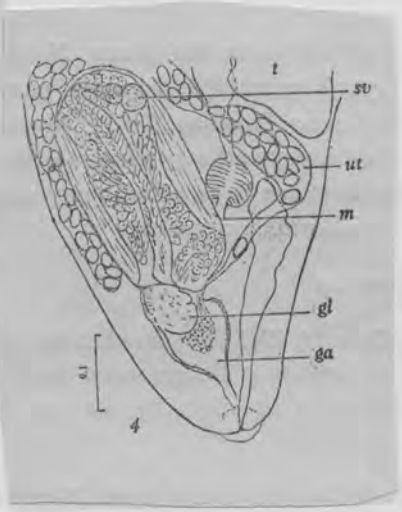
Type specimen : U. S. Nat. Mus. Helm. Coll. No. 48730.

Description (Based on a single specimen): Length 1.415 mm. greatest width, near midbody, 0.462 mm. Rhynchus cone-shaped, ex-

* Kindly identified by Dr. Leonard P. Schultz, U. S. National Museum.

panded at anterior end to form a flattened disc 0.154 mm. in diameter. Mouth 0.308 mm. (or about 1/4 body length) from posterior end of body; pharynx 0.069 mm. long by 0.085 mm. wide; intestinal cecum extending forward not quite to midbody. Testes tandem, near right side, separated by uterus and the ovary; anterior testis at midbody level. Cirrus sac (Fig. 4) in posterior body third, very wide, 0.331 by 0.154 mm., with very thick walls except at the ends; containing a long narrow pars prostatica extending the entire length of cirrus sac, bending near the base to connect with the small, spherical seminal vesicle. Genital atrium about ½ length of cirrus sac; genital lobe single, indented at right edge. Genital pore ventral near posterior end of body. Ovary deeply 3-lobed, a 4th anterior mass probably being Mehlis' gland; ovary between and slightly to left of testes. Uterus filling most of midbody region extending to a level 0.385 mm. from anterior end of body, sending one loop between cirrus sac and left edge of body, not extending posterior to cirrus sac; eggs brown, 30 to 32 by 21 to 22 μ. Vitelline follicles in two, lateral separated clusters just anterior to anterior testis; follicles fairly large, number uncertain but between 9 to 11 on each side. Excretory pore terminal; excretory vesicle extending to mid-pharynx level along right side of genital atrium.





Discussion : Only four species are known in the genus *Neidhartia*: *N. neidharti* Nagaty, 1937; *N. ghardagae* Nagaty, 1937; *N. synodi* (Yamaguti, 1938) Manter, 1940; and *N. microrhyncha* Chauhan, 1943. My species differs from all of these in its lobed ovary and very thick-walled cirrus sac. So far as I know, no other gasterostome has a lobed ovary and only *Prosorhynchus rotundus* has a very thick-walled cirrus sac.

Neodollfustrema xishaense ~~sp. nov.~~. (fig. 6) Gu and Shen, 1983

Three specimens were secured from the intestine of a *Gymnothorax melanospilus* (Bleeker).

This species is characterized by its ovary being intertesticular. It differs from the related species *N. gravidum* (Manter, 1940) in: (1) the body shape (2) arrangement of denticles on the rhynchus (3) shape of the caecal sac, (4) vitelline follicles extending in front of the caecal sac and (5) smaller size of egg.

Xisha Islands, Guangdong Province, China

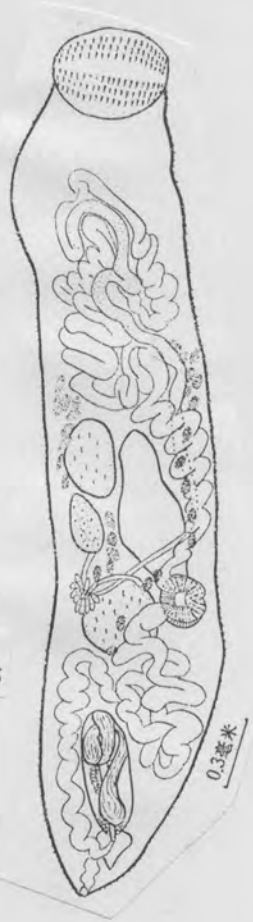


图 6

Neoprosorhynchinae n. subfam.

Subfamily diagnosis. — Bucephalidae: Body subcylindrical, spinose. Rhynchus inverted conical. Pharynx pre-equatorial, intestine short. Testes in pharyngo-intestinal region. Cirrus pouch comparatively long. Ovary posttesticular. Vitellaria in testicular zone. Excretory vesicle Y-shaped (?).

Neoprosorhynchus Dayal, 1948

Generic diagnosis. — Bucephalidae, Neoprosorhynchinae: Body small, subcylindrical, spinose. Rhynchus inverted conical. Mouth pre-equatorial. Intestine saccular, directed forward from pharynx. Testes tandem, on the left of pharynx and esophagus. Cirrus pouch not reaching to pharynx. Genital lobe present. Genital pore ventroterminal. Ovary opposite and posterior to testes, behind oral aperture, giving rise to germiduct at its anterior end; shell gland complex immediately anterior to ovary. Vitelline follicles small, scattered irregularly on either side of intestine and partially covering it. Uterus filling up entire space between ovary and genital atrium; eggs very small. Excretory vesicle Y-shaped, arms reaching to intestine, pore terminal. Intestinal parasites of marine fishes.

Genotype: *N. purius* Dayal, 1948 (Pl. 36, Fig. 462), in *Epinephelus lanceolatus;* Puri, India.

[The generic name is neuter in gender! cf. Copenhagen Decisions on Zool. Nomencl. 1953, p. 51].

NEOPROSORHYNCHUS Dayal,1948

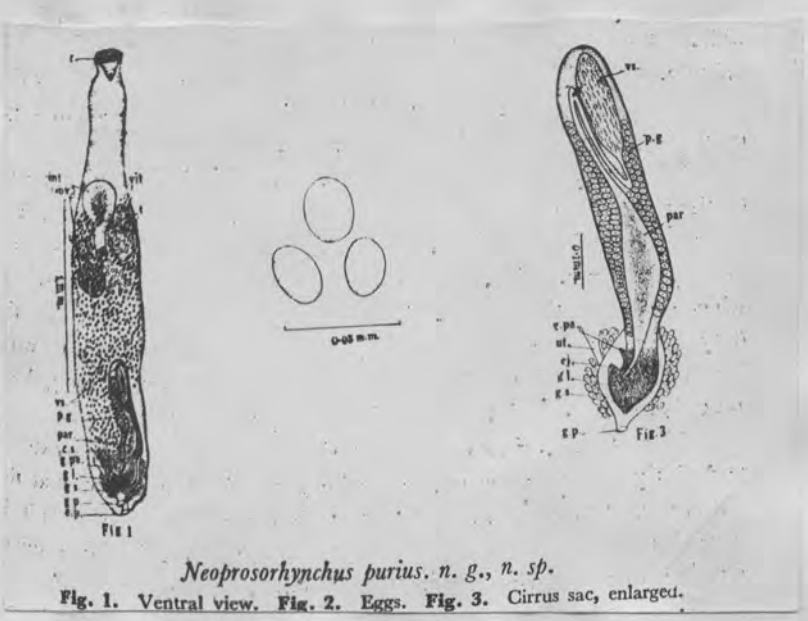
Like Prosorhynchus except the ovary is posterior to the two testes and on the opposite side and the excretory vesicle is Y-shaped.

Type species: N.purius Dayal,1948
from Epinephelus lanceolatus
at Puri, India

No figure was given of the excretory vesicle but the so-called Y-shaped vesicle of some Bucephalopsis has one rudimentary arm and is not truly Y-shaped. Arrangement of the gonads should be confirmed. Status of genus rather doubtful

N.purius Dayal,1948

Length 2.4; width 0.37.
Rhynchus or rostellum cone-shaped/
Mouth 1.04 from anterior end. Cecum directed forward.
Testes tandem on left at level of pharynx and esophagus.
Cirrus sac 0.72 by 0.11.
Ovary posterior to testes, on the right, 1.1 mm. from anterior end.
Vitelline follicles very small scattered irregularly on either side of intestine and partially covering it.
Eggs brown, 25 to 27 by 18 to 21 u.
Host: Epinephelus lanceolatus



Neoprosorhynchus purius. n. g., n. sp.
Fig. 1. Ventral view. **Fig. 2.** Eggs. **Fig. 3.** Cirrus sac, enlarged.

Neoprosorhynchus xishaensis ~~sp. nov.~~ (fig. 5) Gu and Shen, 1983

Only one specimens was obtained from the stomach of one of thirty-six *Selar crumenophthalmus* (Block).

This species closely resembles *N. purius* Dayal, 1945, but differs from it by the body being spiny and short with body ratio: 1:3 as against to 1:6.4 in *N. purius*, by the testes being larger than the ovary and lesser number of vitelline follicles.

Xisha Islands, Guangdong Province, CHINA

图 5 西沙新前实蛭虫(新种) *Neoprosorhynchus xishaensis* sp. nov. 的腹面图

NUITREMA Kurochkin, 1975

This genus is in a separate family, Nuitrematidae, but it has gasterostome characteristics. Don't overlook it.

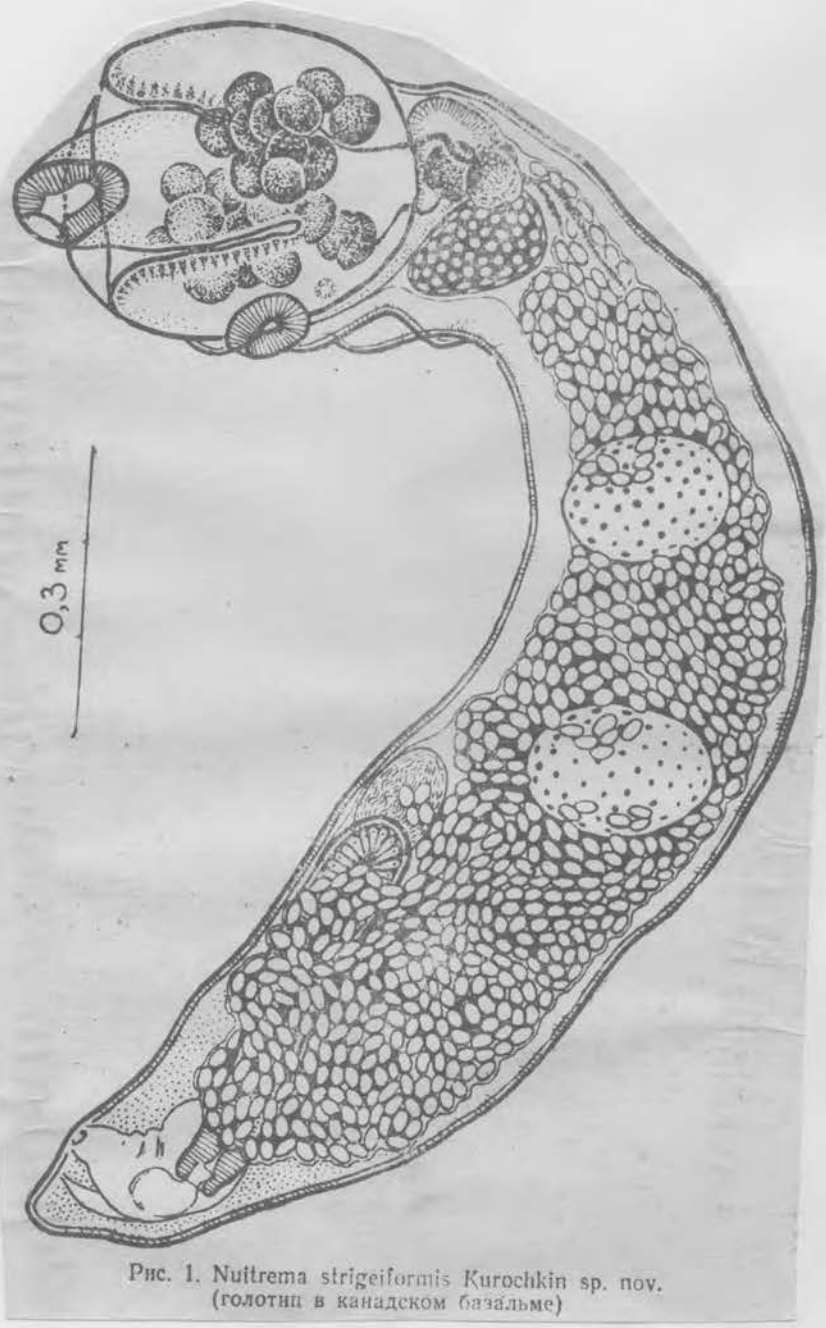


Рис. 1. Nuitrema strigeiformis Kurochkin sp. nov. (голотип в канадском бальзаме)

Separata de Memórias do Instituto Oswaldo Cruz,
Fasciculo 1 — Tomo 65

SÔBRE UM NÔVO GÊNERO DE *PROSORHYNCHINAE* NICOLL, 1914 E NOVOS DADOS SÔBRE *PROSORHYNCHUS BULBOSUS* KOHN, 1961 E *RHIPIDOCOTYLE QUADRICULATUM* KOHN, 1961 (TREMATODA, BUCEPHALIFORMES) *

ANNA KOHN

Instituto Oswaldo Cruz, Rio de Janeiro, Guanabara

(Com 5 estampas)

Durante a excursão do Instituto Oswaldo Cruz ao Estado do Espírito Santo em novembro de 1964, foi coletado, no estômago e intestino de um mero, material de trematódeos bucefaliformes cujo estudo, por nós realizado, evidenciou tratar-se de uma espécie ainda não descrita e que deve ser incluída, em nôvo grupamento genérico, na subfamília *Prosorhynchinae* Nicoll, 1914.

Ao descrever êsse material, aproveitamos para, reproduzindo e ampliando as descrições originais de *Prosorhynchus bulbosus* Kohn, 1961 e *Rhipidocotyle quadriculatum* Kohn, 1961, publicadas em nota prévia, adicionar-lhes figuras e quadros de suas principais medidas, objetivando melhor os conhecimentos que delas temos.

Paraprosorphynchus gen. n.

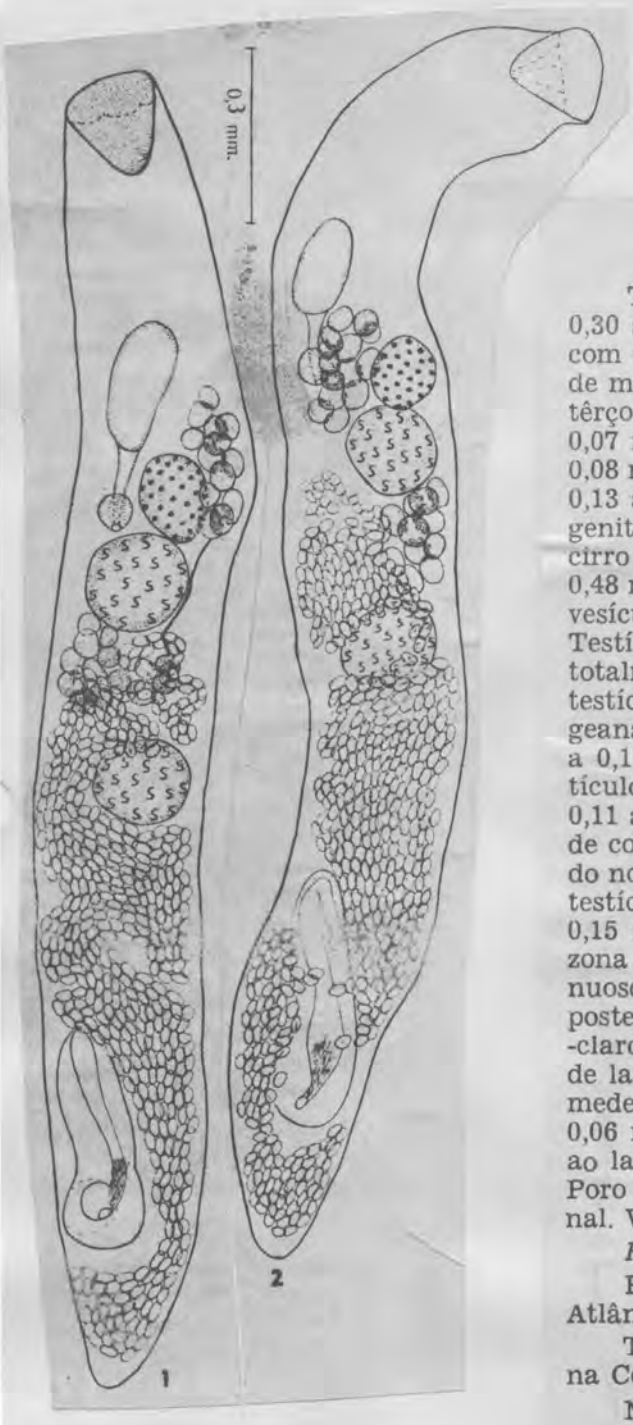
Prosorhynchinae. Corpo alongado. Cutícula espinhosa. Extremidade anterior com *rhynchus* em forma de funil. Intestino dirigido para diante. Átrio genital situado próximo à extremidade posterior do corpo. Bôlsa do cirro alongada, contendo vesícula seminal, parte prostática e cirro. Testículos mais ou menos arredondados, pós-ovarianos, separados um do outro pelo útero e por um grupo de folículos vitelínicos. Ovário pré-testicular. Útero sinuoso, dirigido da região do ovário até a extremidade posterior do corpo. Vitelinos divididos em dois grupos: um lateral ao ovário, pré-testicular, e outro situado abaixo do testículo anterior. Poro excretor terminal. Parasito de peixes marinhos.

Espécie tipo — *P. jupe* sp. n.

Na subfamília *Prosorhynchinae* Nicoll, 1914, de acôrdo com SKRJABIN & GUSCHANSKAJA (1962), são incluídos os seguintes gêneros: *Proso-*

rhynchus Odhner, 1905, *Rhipidocotyle* Diesing, 1858, *Alcicornis* MacCallum, 1917, *Dollfustrema* Eckmann, 1934 e *Telorhynchus* Crowcroft, 1947.

Paraprosorhynchus gen. n. é mais próximo de *Prosorhynchus*, do qual se afasta pela disposição dos vitelinos.



Kohn, 1967

Paraprosorhynchus jupe sp. n.
(Est. 1, figs. 1-4)

Trematódeos alongados com 1,52 a 2,53 mm de comprimento por 0,30 a 0,40 mm de largura. Cutícula espinhosa. Extremidade anterior com *rhynchus* de 0,14 a 0,21 mm de comprimento por 0,15 a 0,19 mm de maior largura. Bôca simples, ventral, situada no limite posterior do têrço anterior do corpo. Faringe muscular presente, medindo 0,06 a 0,07 mm de diâmetro. Esôfago presente, com aproximadamente 0,06 a 0,08 mm de comprimento. Ceco intestinal dirigido para diante, medindo 0,13 a 0,22 mm de comprimento por 0,08 a 0,10 mm de largura. Átrio genital situado próximo à extremidade posterior do corpo. Bôlsa do cirro alongada, dirigida do poro genital para diante; mede 0,33 a 0,48 mm de comprimento por 0,10 a 0,13 mm de maior largura e encerra vesícula seminal elipsóide, canal ejaculador, células prostáticas e cirro. Testículos de contôrno liso, mais ou menos arredondados, situados quase totalmente no mesmo campo e com zonas fastadas, pós-ovarianos; o testículo anterior, podendo ficar situado na zona pré-faringeana, faringeana ou pós-faringeana, mede 0,13 a 0,19 mm de comprimento por 0,15 a 0,17 mm de largura; o testículo posterior, que fica separado do testículo anterior por alças uterinas e por um grupo de vitelinos, mede 0,11 a 0,15 mm de comprimento por 0,16 a 0,19 mm de largura. Ovário de contôrno liso, mais ou menos arredondado, pré-testicular; fica situado no campo testicular e sua zona é parcialmente coincidente com a do testículo anterior; mede 0,11 a 0,17 mm de comprimento por 0,12 a 0,15 mm de largura. Glândula de Mehlis logo abaixo do ovário, na zona testicular anterior. Canal de Laurer não evidenciado. Útero sinuoso, dirigindo-se da região do ovário para trás, até a extremidade posterior do corpo. Ovos de casca lisa, operculados, de côr castanho-claro; medem 0,030 a 0,033 mm de comprimento por 0,017 a 0,020 mm de largura. Vitelinos constituídos por folículos bem desenvolvidos, que medem aproximadamente 0,04 a 0,07 mm de comprimento por 0,03 a 0,06 mm de largura, dispostos em dois grupos: um grupo fica situado ao lado do ovário e o outro fica situado abaixo do testículo anterior. Poro genital feminino abrindo-se no átrio genital. Poro excretor terminal. Vesícula excretora não estudada com detalhe.

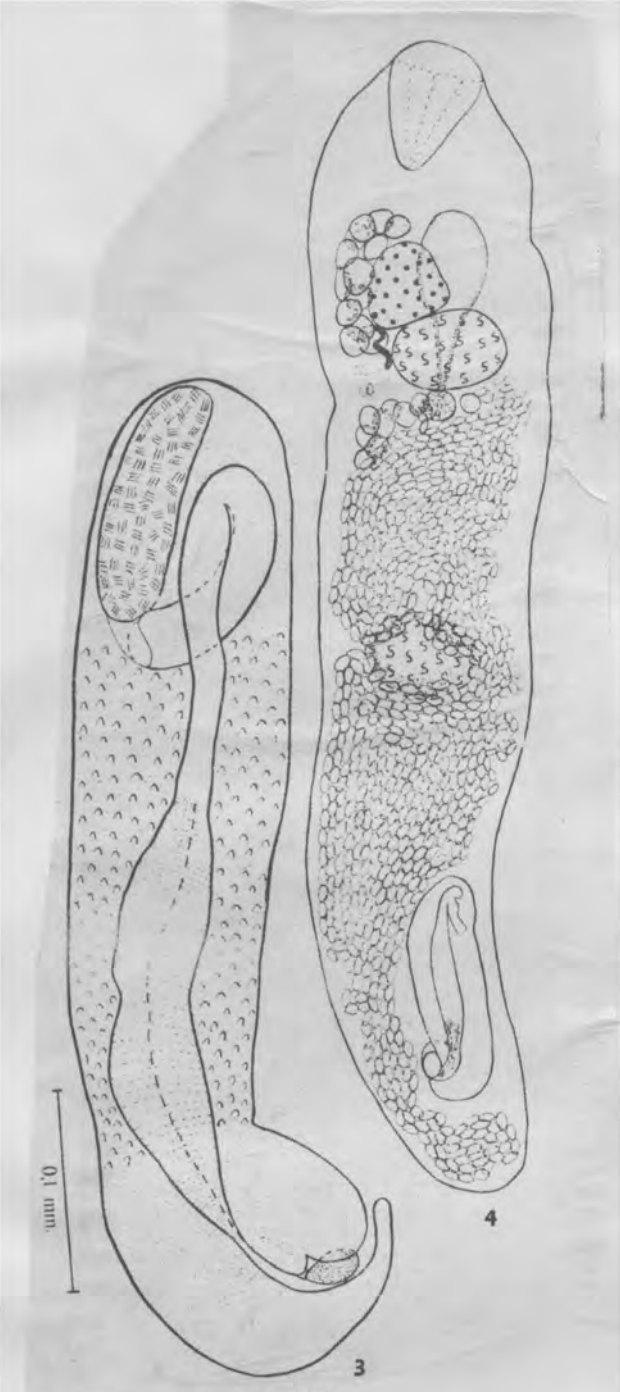
Habitat — Estômago e intestino de *Promicrops guttatus* L. (mero).

Proveniência — Ilha N. S. da Conceição, baía de Vitória (Oceano Atlântico), Estado do Espírito Santo, Brasil.

Tipo n.º 29 988 a e parátipos ns. 29 988 b-m e 29 996 a-c depositados na Coleção Helmintológica do Instituto Oswaldo Cruz.

No Quadro I damos as principais medidas de alguns espécimes.

see print for table of measurements of individual specimens



ôvo gênero de Prosorhynchinae

Paurorhynchus Dickerman, 1954

Generic diagnosis. — Bucephalidae, Dolichoenterinae: Body elongate, cylindrical, unspined. Rhynchus weakly developed. Pharynx about one third of body length from anterior end; intestine long, turning backward to region of anterior testis. Testes large, strongly lobed, oblique, in posterior two-fifths of body. Cirrus pouch half as long as posterior testis, moderately thick-walled, containing internal seminal vesicle, short pars prostatica surrounded by prostate gland cells. Genital pore terminal. Ovary small, opposite anterior testis, shell gland complex postovarian. Laurer's canal opening at level of shell gland. Vitellaria consisting of linear series of irregular acini, extending on each side of body from level of cecal flexure to level of anterior testis. Gravid uterus occupying all available space between level of anterior end of vitellaria and posterior extremity; eggs small. Excretory vesicle long, tubular, reaching to near pharynx. Parasitic in body cavity of freshwater fishes.

Genotype: *P. hiodontis* Dickerman, 1954 (Pl. 36, Fig. 467) in *Hiodon tergisus;* Lake Erie and southern tributaries.

Dickerman, 1954

Paurorhynchus hiodontis n. g., n. sp.
(Figs. 1, 4)

Diagnosis: BUCEPHALIDAE: PAURORHYNCHINAE, n. subfam.: Body elongate, nearly circular n cross-section, averaging 6.38 mm. (8.0–5.25) long by 1.68 mm. (2.06–1.37) wide, ends taper- ng in living condition but rounded in flattened and preserved specimens. Cuticula thin, without pines. Anterior end in living specimens extended in form of a small rhynchus; rhynchus re- racted in fixed specimens causing anterior end to appear to bear a weak sucker. Mouth mid- entral, about one-third length of body from anterior end; prepharynx very short; pharynx veraging 0.168 mm. (0.21–0.133) in diameter; esophagus short, directed anterodorsally, ex- panding to form an elongated digestive sac which turns and extends posteriorly to region of nterior testis. Excretory bladder long and tubular, extending from near pharynx to near osterior end of body, and terminating with a short excretory duct leading to the terminal pore; nain excretory canals opening into excretory bladder near posterior end. Testes in posterior wo-fifths of body, oblique, much lobed, anterior testis slightly larger and more lobed than poste- ior. Cirrus pouch, situated in mid-line of body near posterior end, half as long as posterior estis, somewhat curved, moderately thick walled; seminal vesicle internal, pars prostatica short, surrounded by prostate gland cells; genital aperture terminal, posterior. Ovary much smaller han testes, variable in shape and number of lobes, situated on right side of body at level of nterior testis or slightly posterior to it. Oviduct coursing posteriorly from ovary, giving off Laurer's canal and receiving common vitelline duct. Oötype posterior to ovary. Uterus at be- ginning narrow and looping but gradually broadening and straightening in anterior end of body bending sharply it then courses posteriorly to terminate in the metraterm opening into genita sinus; uterus in gravid specimens occupying all available space. Vitellaria consisting of 12 t 17 small follicular masses in linear series, loosely separated on each side of body, and usuall extending from a level midway between mouth and anterior end of body to level of anterio testis. Vitelline ducts extending posteriorly from series of follicles to level of ovary where lef one crosses the body to join right duct in vicinity of ovary. Discharged eggs (Fig. 2) elongate oval with prominent operculum and abopercular knob and average 0.072 mm. (0.08–0.06) lon by 0.032 mm. (0.04–0.028) wide.

Development: Unknown.

Host: Hiodon tergisus.

***Location:* Mature specimens in body cavity; immature specimens in liver.**

***Locality:* Lake Erie and southern tributaries.**

***Type:* Holotype and paratype in the Helminthological Collection, U. S. National Museum, No. 37404.**

Paurorhynchus n. g.

***Diagnosis:* BUCEPHALIDAE: PAURORHYNCHINAE, n. subfam.: Body elongate, cylindrical. Cuticula thin, without spines. Anterior end with weak inconspicuous rhynchus only. Oral aperture ventral, without sucker, pharynx present, caecum an elongated arched sac. Excretory bladder elongate. Testes oblique, much lobed, in posterior two-fifths of body. Cirrus pouch half as long as posterior testis. Genital aperture terminal at posterior end of body. Ovary lobed, much smaller than testes, situated on right side of body on level with anterior testis. Seminal receptacle absent. Laurer's canal present. Vitellaria small follicular masses in linear series on sides of body. Mature adults in body cavity of host.**

Type species: Paurorhynchus hiodontis.

Paurorhynchinae n. subfam.

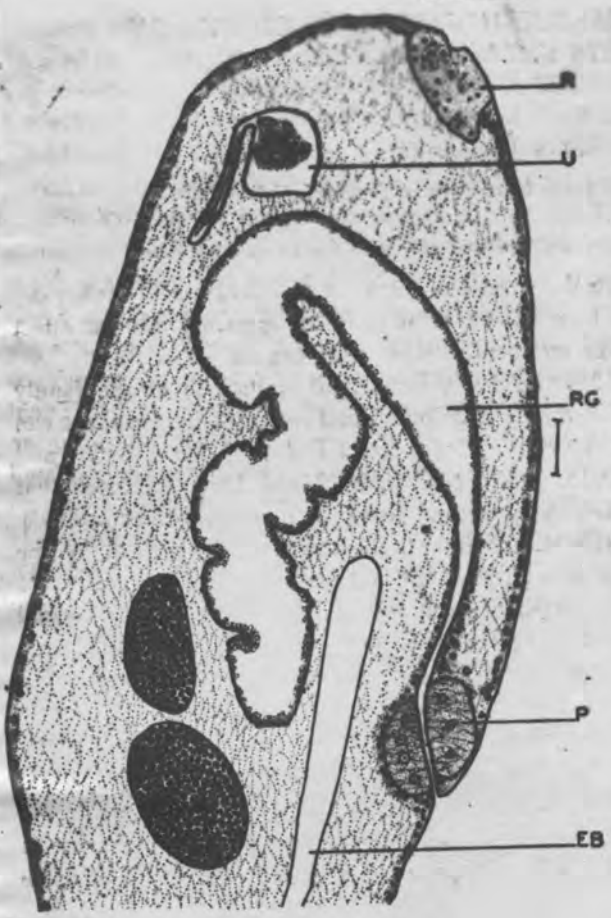
***Diagnosis:* BUCEPHALIDAE; Body elongate. Cuticula thin, without spines. Anterior end with weak, inconspicuous rhynchus only. Ovary and testes lobed. Ovary dextral, testes oblique. Mature adults in body cavity of fishes.**

Type and only Genus: Paurorhynchus.

Jour. Parasit. 40 (3): 311-315.

1964. MARGOLIS reported *P. hiodontis* from *Hiodon alosoides* (Raf.), from Steep Creek which flows into the north Saskatchewan River about 20 miles west of Prince Albert, Saskatchewan. New host, new locality.

PLATE I



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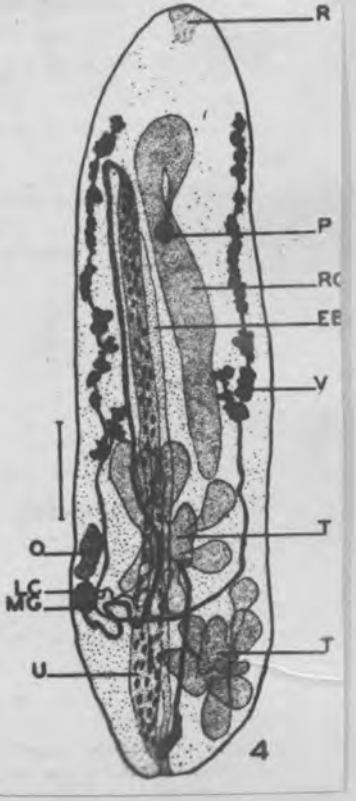


4

Pseudoprosorhynchus Yamaguti, 1938

Generic diagnosis. — Bucephalidae, Neidhartiinae: Body elongate, spined. Rhynchus discoid, not forming such a powerful plug as seen in *Neidhartia* Nagaty, 1937, with shallow depression at apical center. Mouth at midbody. Intestine short, directed forward from pharynx. Testes on one side of body with ovary and shell gland complex between. Cirrus pouch well developed, containing elongate vesicula seminalis and long twisted pars prostatica surrounded by numerous prostate cells. Genital lobe present. Genital pore ventral, near posterior extremity. Ovary and shell gland complex between two testes, usually on the right of digestive organ. Laurer's canal opening middorsally behind posterior testis. Uterus mainly sinistral, not extending further forward than vitellaria which are confined to the area between the rhynchus and the intestine. Excretory vesicle rather short. Parasites of marine fishes.

Genotype: *P. synodi* Yamaguti, 1938 (Pl. 1, Fig. 9), in *Synodus japonicus;* Numazu, Japan.

PSEUDOPROSORHYNCHUS Yamaguti, 1938

Bucephalidae Poche, 1907; Prosorhynchinae. Body elongate, spined, with rostellum. Mouth equatorial. Intestine directed anteriorly. Testes dextral, with ovary and shell gland between. Cirrus pouch well developed, containing elongate vesicula seminalis, long twisted pars prostatica, numerous prostatic cells and curved ductus ejaculatorius. Genital lobe present. Genital pore ventral, near excretory pore. Ovary level with intestine. Shell gland compact. Laurer's canal opening dorsally behind posterior testis. Uterine coils mainly sinistral, extending as far forward as vitellaria. Vitellaria follicular, in two lateral groups between rostellum and intestine. Excretory vesicle tubular, not very long, with ventroterminal pore. Parasitic in marine fishes.

Genotype. Pseudoprosorhynchus synodi

This genus is like Neidhartia Nagaty, 1937 in that the ovary is between the two testes.
In Neidhartia the ovary is on the left rather than directly between the testes but this character is hardly generic. ~~Therefore, Pseudoprosorhynchus is considered a synonym of Neidhartia~~
The genus is characterised by a lenticular rhynchus. (see Velasquez, 1959)

Neidhartia synodi (Yamaguti) Bucephalidae
~~Manter, 1940~~

Syn: Pseudoprosorhynchus synodi Yamaguti, 1938

Size: 1.1 X 0.475 mm.

Anterior Sucker: 0.17 mm in transverse diameter, with a shallow concavity at its apical center.

Mouth: Equatorial

Pharynx: Globular, 66μ in diameter.

Intestine: Saccular, 0.17 X 0.125 mm, reaching to near middle of anterior third of body.

Testes: Subglobular, dextral, separated from each other by ovary and shell gland; the anterior on a level with anterior end of intestine and the posterior with pharynx.

Cirrus Sac: Short, cylindrical, sinistral, extending a little into middle third of body.

Seminal Vesical: Elongate, occupying antero-medial part of cirrus pouch.

Ovary: Immediately dextral to intestine, between anterior testis and shell gland.

Vitellaria: About 30 follicles in number, formed in life two lateral groups between the rostellum and the intestine, but are confluent and occupy the entire neck region in the mount.

Uterus: To the posterior portion of the vitellaria.

Eggs: Oval, thick-shelled, 27-30 X 18-20μ.

Host: Synodus japonicus (Houttuyn)

Locality: Numazu, Japan

Reference: Studies on the Helminth Fauna of Japan. Part 21. Kyoto, Japan Revised edition

Comparisons: Dolichoenterum Ozaki

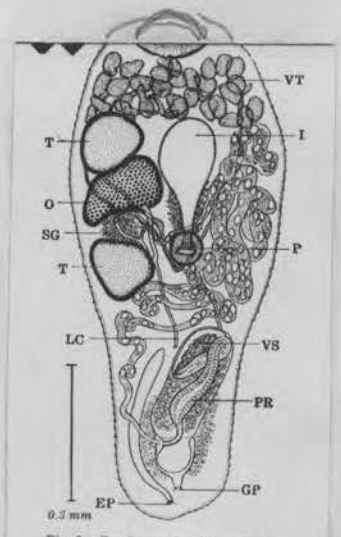


Fig. 3. *Pseudoprosorhynchus synodi*; ventral view.

Rudolphinus, ~~New Genus~~ Stunkard, 1974

Generic diagnosis. Subfamily Prosorhynchinae: body plump, cuticula with flattened scales; rhynchus conical, extends to or beyond the level of the brain; exposed face forms a reniform disc with median ventral indentation; mouth in middle third of body, prepharyngeal atrium with glandular cells; intestine short; reproductive organs mostly in posterior half of body; ovary dorsal, near midbody, may partially overlap anterior testis, which is ventral; Laurer's canal present, seminal receptacle absent; uterus pre- and postpharyngeal; testes diagonal, may overlap; cirrus sac lateral, opposite the testes, extends to testicular level, contain seminal vesicle, prostate, and ejaculatory duct; genital atrium near posterior enc receives openings of metraterm and ejaculatory duct and contains the male cc pulatory organ; excretory vesicle short; collecting ducts enter near the anterio end and bifurcate at pharyngeal level to form anterior and posterior branches Type species, *Rudolphinus crucibulum*.

The differences between the larval and adult stages of *P. squamatus* and *P. crucibulum* justify the erection of a new genus to receive *P. crucibulum*. The new genus is named *Rudolphinus*, with *Rudolphinus crucibulum* (Rudolphi, 1819) as the type species.

Probably species other than *crucibulum*, included in Manter's Group II, should be transferred to the new genus *Rudolphinus*, but such action would be warranted only after a thorough and detailed study of the individual species.

Confusion concerning the gender of *Prosorhynchus* led Eckmann (1932) and Manter (1953) to write the specific name *crucibulus*. For aid in clarification of the difficulty I am indepted to Drs. Curtis Sabrosky and George Steyskal, Systematic Entomology Laboratory, U.S. National Museum. The statement by Dr. Steyskal is so succinct and lucid it is quoted: "*Prosorhynchus* is indeed masculine according to the code (Art. 30, a.i. 3), wherein names ending in *rhynchus* are specifically mentioned in the examples cited, although from a grammatical standpoint it should be neuter because *rhynchus* is transliterated from a Greek neuter noun *rhynchos* with the regular Latin substitution of *us* for *os*, which is not really a change of ending. Many names in birds end in *-rhynchus* and they are all treated as masculine. The species-name *crucibulum*, however, is a noun in apposition. It is not found in Latin dictionaries because it is medieval Latin, first used in the Middle Ages. Latin of all periods is valid in nomenclature. The history of the word may be seen under the word *crucible* in Webster III. A noun in apposition does not change when transferred to a genus of different gender; therefore, *crucibulus* is incorrect." Doctor Steyskal also suggested the new generic name, *Rudolphinus*.

Gasterostomata

Prosorhynchus crucibulum (Rud.) Odhner, 1905

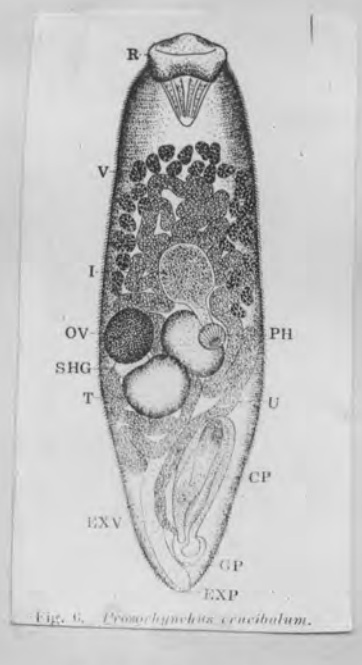
(Monostomum crucibulum Rud., 1819; Gasterostomum armatum Mol. Gast. crucibulum Olss. nec van Ben.)

From Odhner: Length 1.75 to 2.25. Body fairly elongate and cylindrical, truncated anteriorly, more pointed posteriorly. Rostellum large, filling anterior end, about 0.35 in diameter. Skin spined. Mouth and intestine as in P. squamatus, also testes and ovary. Vitellaria in anterior third of body, not reaching ovary. Eggs about 30 µ. Cirrus sac as in P. squamatus.
Host: Conger sp., Mediterranean, Sweden.

From Ozaki, 1928: Body elongate, 1.75 to 3.4 by 0.53 to 1.3. Anterior end truncate, posterior end pointed. Skin spiny. Rhynchus large, conical, embedded in anterior end; exposed part squarish. Pharynx central; intestine a short simple blind sac extending fowards nearly 1/3 to anterior end. Testes two oblique, one on each side of the pharynx. Ovary globular, close to right body margin, in front of right testis. Cirrus sac on the left side behind testes. Vitelline arch in anterior third of body. Uterus long, bounding fowards by the vitelline arch. Eggs 25 to 30 by 15 to 21 µ. Excretory vesicle a short simple sac; pore terminal, separate from genital pore.
Host: Leptocephalus
Locality: Sweden, Scotland, Mediterranean, Japan.

From Layman 1930

From Nicoll, 1910



From Ozaki 1928

From Nicoll 1910:

2 to 3.7 mm. No egg production under 2. Shape more elongate than in P. aculeatus Rhynchus very large, wedge-shaped. Mouth almost exactly in center of body. Pharynx 0.21 mm. in diameter. Ex. vesicle extending 1/3 body length.

Gonads variable in position. Testes often almost across from each other, usually diagonal, may overlap. Vitellaria forming an arc. Eggs 26 to 30 by 16 to 21, average 29 by 19 µ. Host: Conger

considered valid by Brinkmann 1957

(over)

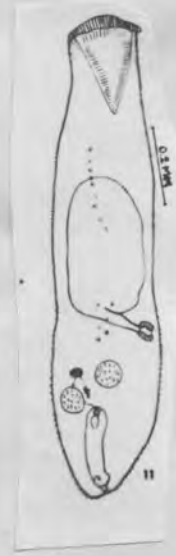
Prosorhynchus crucibulus (Rudolphi, 1819) Odhner, 1905
(Figs. 11–13)

Synonyms: *Monostomum crucibulum* Rudolphi, 1819
Gasterostomum armatum Molin, 1859
(?)*Bucephalus crux* Levinsen, 1881

Host: Sparus berda (Forskäl)
Location: gills and muscles
Locality: (fish ponds), Malabon, Rizal, Luzon island, Philippines
Prevalence: more than 50 from 1 of 2 hosts examined.
Topotype: U.S. Nat. Mus. Helm. Coll. No. 37688; University of the Philippines, Dept. of Zoology, Helm. Coll. No. 539 (2) g.

Specific diagnosis: (Based on 5 immature specimens; measurements from 4). Body elongate, broad, 1.05–1.14 by 0.22–0.3. Cuticle with moderately coarse spines set in quincunx fashion, becoming sparse posteriorly. Rhynchus conical, wedge-shaped, rather large, muscular, measuring 0.24–0.29 by 0.18–0.22. Mouth at end of second third of body; pharynx muscular, 0.043–0.073 by 0.06–0.077 (2 specimens); oesophagus moderately long, 0.043 (1 specimen); intestine saccular, broad and large, 0.27–0.22 (2 specimens). Gonads in posterior ¼th of body. Testes oblique tending to be tandem, globular. Cirrus sac comparatively small, 0.14–0.2 by 0.034–0.05; vesicula seminalis fairly large (Fig. 13); pars prostatica elongate (Fig. 12); genital atrium well developed, with prominent papillae; genital pore subterminal, at end of elongate duct (Fig. 12). Ovary poorly developed, on right, anterior to posterior testis. Uterus without eggs. Vitellaria in 2 lateral rows, in arch formation (one specimen). Vitellaria not well developed (Fig. 11), in 2 lateral rows at level of oesophagus, interrupted opposite gut, and forming single row extending somewhat anterior to intestine. Excretory vesicle? Excretory pore terminal.

Discussion: This species is strikingly similar to *Prosorhynchus crucibulus* (Rudolphi, 1819) Odhner 1905 as described by Caballero, et al (1953) in the shape of the rhynchus, arrangement of vitellaria, nature of pharynx and intestine, position and arrangement of genital organs and cuticular spines. It is about ½ the size of their specimens and the conical rhynchus is more elongate with a more acute anterior end. Their measurements of the width of the rhynchus of immature specimens are somewhat greater than those given by Odhner (1905) for this organ in mature worms.



Nicoll (1910) aware of the inadequacy of the description of *P. crucibulus* (Rudolphi, 1819) Odhner, 1905, gave a fairly detailed description of this species based on his materials.

The author agrees with Manter (1953) that *P. squamatus* Odhner 1905 and *P. crucibulus* (Rudolphi, 1819) Odhner, 1905 are different species and that *P. squamatus* should be designated as a valid species and not as a synonym of *P. crucibulus*. Odhner's descriptions and illustrations show that *P. squamatus* has a smaller, oval or lenticular rhynchus while that of *P. crucibulus* is larger and conical. Likewise Manter (1953) is correct in recognizing as good species *P. costai* Travassos *et al* (1928) and *P. scalpellus* McFarlane, 1936, contrary to Kniskern's (1952) synonymy. McFarlane's type specimen of *P. scalpellus*, U.S. Nat. Mus. Helm. Coll. No. 9034, has been examined and shows the characters more definitely than do his illustrations.

From Velasquez, 1959

2. *Prosorhynchus crucibulus* (Rudolphi, 1819)

Hospedador: *Menticirrhus undulatus* (Girard)*
Localización: intestino.
Distribución geográfica: Bahía Magdalena, Baja California, México.

Esta especie está representada en esta colección, por un solo ejemplar. El único relato previo de esta especie en el Océano Pacífico fue hecho por Caballero, Bravo y Grocott (1953). Su hospedador, *Polynemus opercularis*, fue colectado cerca de la ciudad de Panamá. La única diferencia entre el ejemplar aquí descrito y los descritos por otros autores está en la posición de los testículos, éstos en los especímenes aquí descritos se presentan uno abajo del otro (tandem) o en posición ligeramente oblicua; en este ejemplar, los testículos están colocados casi simétricamente. Aunque este tipo de variación es importante para la clasificación de los tremátodos, muchas variantes fueron notadas en esta colección dentro de la familia *Bucephalidae*.

From:- Arai, H.P., 1962

BUCEPHALIDAE POCHE, 1907

11. *Prosorhynchus crucibulum japonicum* n. subsp.

(Pl. XV, Fig. 8)

Yamaguti, 1958

Habitat: Small intestine of *Conger myriaster*.

Material: A single gravid specimen stained and mounted *in toto*.

Locality and date: Inland Sea; September 8, 1957.

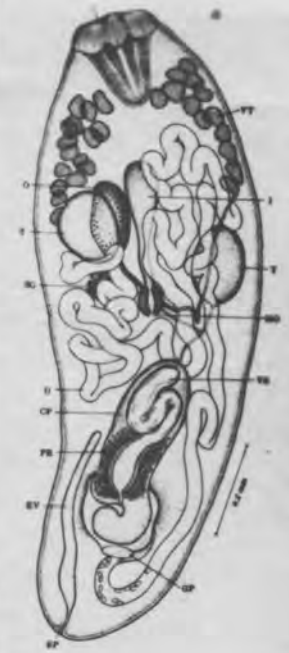
Body shaped like a plump rod, swollen at level of testes, about 2 mm long by 0.7 mm wide. Rhynchus wedge-shaped, 0.38×0.28 mm. Pharynx 90 μ in diameter, pre-equatorial. Esophagus 0.15×0.03 mm, intestine 0.2×0.09 mm, directed straight forward, with the blind end a little beyond ovary. Testes oval, 0.2–0.22×0.15–0.16 mm, situated obliquely one on each side of esophagus. Cirrus pouch 0.53 mm long by 0.2 mm broad, containing sigmoid, cylindrical, seminal vesicle 80 μ wide, well developed pars prostatica 0.13 mm wide, and a short cirrus only 80 μ long by 20 μ wide. Genital atrium 0.2 mm in diameter, with wide ventral aperture 0.3 mm from posterior extremity.

Ovary oval, 0.22–0.13 mm, overlapping right testis dorsomedially; shell gland behind right testis. Uterus winding first between right testis and cirrus pouch, then convoluted between left testis and left vitellaria, finally descending on the left of cirrus pouch as far back as beyond genital pore, where it turns forward to open into the genital atrium; eggs oval, 26–28 μ long by 20–21 μ broad. Vitelline follicles

forming symmetrical groups of 12 and 14 each in shoulder region between rhynchus and testes.

Excretory vesicle tubular, extending on the right of cirrus pouch as far forward as anterior end of cirrus pouch; pore terminal.

This species resembles *Prosorhynchus crucibulum* (RUD.) of NICOLL, 1910, or of OZAKI, 1924, very closely, but differs from it in the shell gland being situated behind the right testis at the level of the pharynx; in OZAKI's specimen the shell gland lies between the ovary and the right testis. The relative position of the testes, ovary and pharynx is subject to great individual variation in the known members of the genus, so that much importance cannot be ascribed to differences in this respect. If the shell gland be also variable in position individually, the present specimen should be referred to *P. crucibulum*, but the contrary seems to be true so far as my experience goes. I would like, therefore, to assign it for the present to a new subspecies, for which the name *Prosorhynchus crucibulum japonicum* is proposed.



Prosorhynchus crucibulum (Rud., 1819) Odhner, 1905

(Fig. 3)

Monostoma crucibulum Rud., 1819.
Distoma crucibulum : Dujardin, 1845.
Gasterostomum crucibulum : Gervais and van Beneden, 1859.

Host and locality : intestine of *Conger conger*, Stn. 7. Bay of Biscay

A single specimen was present, and it was examined as a whole mount and then in serial sections. It is a small worm, truncated anteriorly and pointed posteriorly, 1·5 mm in length and 0·87 mm in maximum width. The cuticle bears numerous scale-like spines. At the anterior end there is a muscular, funnel-shaped rhynchus, 0·48 mm across at its widest point and extending posteriorly to very near the intestine, that is, about 0·55 mm from the anterior end of the worm. A slit-like transverse mouth, 52 μm across, is situated at about the anterior third of the body length, and near the base of the rhynchus. It leads immediately to a nearly globular pharynx, measuring 0·108 × 0·115 mm, which in turn leads into a muscular oesophagus

R. A. BRAY

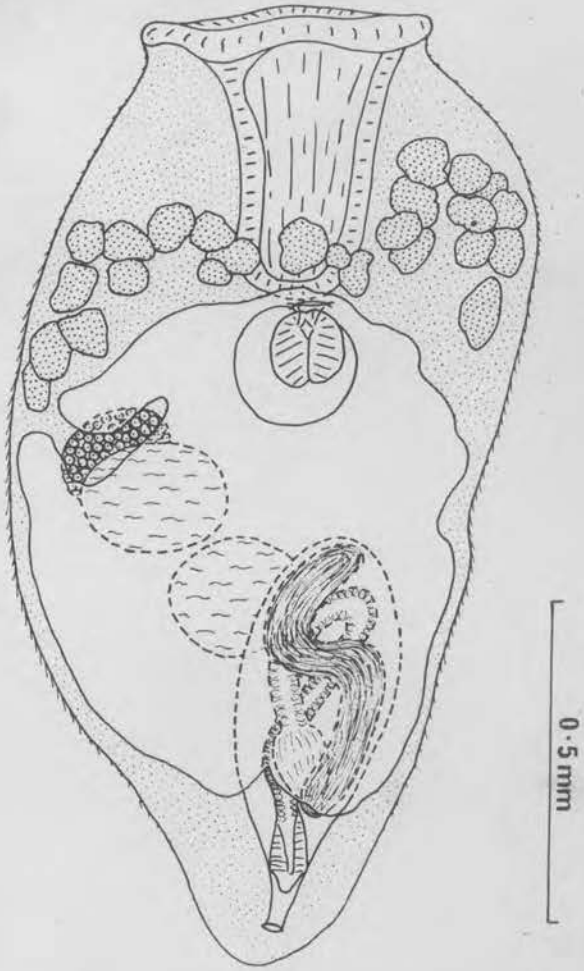


FIG. 3. *Prosorhynchus crucibulum* (Rud.) : ventral view.

- OVER -

0·07 mm long, thence into the saccular intestine, which lies dorsally to the pharynx and is about 0·2 mm × 0·16 mm.

The excretory pore is terminal posteriorly, and the excretory vesicle reaches to about the level of the anterior end of the cirrus-sac.

The genital sinus opens near to the posterior extremity of the body on the ventral side of the worm. A muscular cirrus-sac, 0·47 mm long by about 0·22 mm wide, reaches anteriorly to a position just in front of the anterior margin of the posterior testis. It contains a sigmoid seminal vesicle, which extends from the foremost extremity of the cirrus-sac to a position near to the posterior extremity, where it forms a muscular bulb before passing into an elongate pars prostatica. This latter organ runs nearly to the anterior of the cirrus-sac before passing posteriorly to where it unites with a relatively short muscular cirrus, which opens into the sinus at the base of the genital tongue. There is no indication of an external seminal vesicle. The testes lie one just posterior to the pharynx with the other just behind it. They are oval with smooth margins and measure 0·27 × 0·19 mm (anterior testis) and 0·21 × 0·2 mm (posterior testis). The ovary, of similar size and shape to the testes (0·2 mm dia.), lies just antero-dorsal to the anterior testis. The 'shell'-gland lies immediately posterior to the ovary, and Laurer's canal opens dorsally just posterior to the ovary. The vitellaria consist of about 25 irregular follicles lying more or less in an arc just behind the rhynchus and anterior to the pharynx and uterus. This latter organ is extensive in the region posterior to the pharynx, obscuring parts of the reproductive system in the whole mount. A short, muscular metraterm enters the genital sinus dorsally to the cirrus-sac. The eggs, which are very numerous and mostly collapsed, measure about 24–26 μm × 16–18 μm.

Prosorhynchus crucibulum is a common parasite of the conger and is morphologically very similar to another parasite of this fish, *P. aculeatus* Odhner, 1905, with which it has been synonymized by Dawes (1947). Brinkmann (1957) has given a number of reasons why he considers these species to be distinct, and, having examined a number of specimens assigned to both species in the collections of the British Museum (Natural History), I agree that the features selected by Brinkmann appear to be of value in distinguishing these species. The most noticeable difference is the size and shape of the rhynchus, which in *P. aculeatus* is small and rounded, and in *crucibulum* is larger and triangular or funnel-shaped. This character appears to be fairly constant, and according to Matthews (1973) the typical shape of the rhynchus in *P. crucibulum* is developed in the metacercaria during its first month in the second intermediate host. As can be seen, the present specimen fits *P. crucibulum* in this, as well as the other less prominent characteristics.

From Bray, 1973

Telorhynchus Crowcroft, 1947

Generic diagnosis. — Bucephalidae, Bucephalinae: Body elongate, covered with minute spines. Rhynchus tapered internally, with single crown of spines interrupted in midventral line. Pharynx in middle third of body. Intestine short. Testes directly or a little obliquely tandem in posterior half of body. Ovary pretesticular. Vitellaria forming an arch in forebody. Uterus not extending beyond vitellaria. Excretory vesicle reaching to level of intestine. Parasitic in intestine of marine fishes.

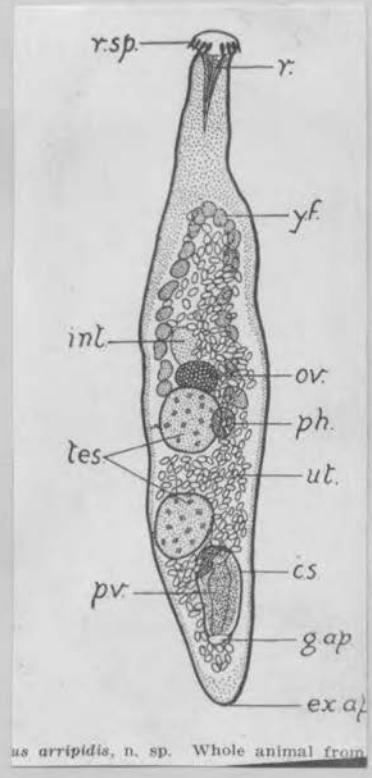
Genotype: *T. arripidis* Crowcroft, 1937 (Pl. 1, Fig. 3), in *Arripis trutta* (Colonial Salmon); Australia, New Zealand.

TELORHYNCHUS Crowcroft,1947

Prosorhynchinae of elongate form. Rhynchus tapered internally and armed with a single circlet of spines interrupted in the mid-ventral line. Body covered with minute spines. Testes directly, or slightly obliquely, one behind the other in posterior half of body. Ovary pretesticular. Vitellaria in a convex bow in the forebody. Uterus not extending anterior to the vitellaria. Laurer's canal present. True seminal vesicle absent. Mouth situated near middle of body-length. Intestine simple, saccular, directed forwards from the mouth.

Type species: Telorhynchus arripidis Crowcroft,1947
from Arripis trutta in Tasmania

Ref. Proc. Linn.Soc. N.S.Wales vol.71: 108-118. 1947



us arripidis, n. sp. Whole animal from

Telorhynchus cociellae, ~~sp. nov.~~ CHANGDONG AND JIWEI, 1976 = GU AND SHEN, 1976

Host: *Cociella crocodila* Tilesius.
Location: Intestine and pyloric caeca.
Locality: Baimajing, Hainan Dao, Nan Hai, China.
Date: May 22, 1964.
Infection: 96 specimens from one of six hosts.

Body long spindle shaped, maxinum width on posterior half of one third of body. Cuticle spineless. Rhynchus terminal, wedge-shaped, armed with a single row of long spines, about 20 in number, 0.108—0.143 × 0.018 mm. Pharynx small, circular in shape, located nearly in center of body. Oesophagus broader. Caecal sac as a long pouch, left to mid-line.

Testes lying in posterior part of anterior half of body, slightly oblique, ovoid in shape. Intertesticular space filled with uterine coils. Cirrus sac club shaped. and 0.173—0.780 mm. apart rrom posterior testis; seminal vesicle oval shaped, and pars prostatica long, 0.534—0.668 mm. in length, surrounded by some undeveloped prostate cells and ending in genital pore at proximal portion of genital lobe.

Ovary overlapping anterior portion of anterior testis, flat globular shaped, and in few specimens intertesticular. Vitellaria pretesticular in two rows. Mehlis' gland behind anterior testis, 0.130—0.217 × 0.130—0.217 mm. Uterus descending to post-testicular level, then turning to ascending limb and extending slightly anterior to vitellaria and descending again to left half of body, coiled in front of cirrus sac.

Eggs more large, thick-walled, oval shaped.

Discussion: only two species of Telorhynchus that have been previously mentioned, namely: *T. arripidis* Croweroft, 1947 as a type of the genus and *T. sp.* found from small carp, *carassius auratus* in Foochow, China. Among them only *T. arripidis* was described. *T. cociellae* n. sp. differs from the type in the body elongated, cuticle smooth, rhynchus short, armed with a single continuous crown of spines, testes smaller comparable with its body size situited in posterior portion of anterior half of body, uterine coils extending anterior to vitellaria, vitelline follicles preovarian and cirrus sac larger. Therefore, it is suggested as a new species and named *Telorhynchus cociellae* for its host. Some of the generic characters should be emended.

图5 鳄齿棘吻牛首吸虫，新种 *Telorhynchus cociellae* sp. nov. 的腹面图。

种名 / 虫体与器官量度	鳄齿棘吻牛首吸虫 Telorhynchus cociellae sp. nov.
体长 Body length	3.724—5.344
体宽 Body width	0.735—0.969
前吸器 Rhynchus	0.217—0.384× 0.251—0.301
咽 Pharynx	0.089—0.100直径
食道 Oesophagus	0.050—0.100× 0.067—0.084
肠囊 Caecal sac	0.451—0.585× 0.200—0.251
前睾 Anterior testis	0.217—0.267× 0.217—0.284
后睾 Posterior testis	0.234—0.301× 0.234—0.301
生殖囊 Cirrus sac	0.785—1.002× 0.150—0.200
贮精囊 Seminal vesicle	0.284—0.384× 0.100
卵巢 Ovary	0.150—0.184× 0.117—0.234
卵黄腺数目 Numbet of vitelline follicles	
左侧 left side	10—14个
右侧 right Side	8--11个
卵黄腺滤泡大小 Size of vitel line follcle	0.100—0.134× 0.084—0.134
卵子 Ova (μ)	24—30×18—24

Bucephalidae Poche, 1907

Telorhynchus hippocampi ~~sp. nov.~~ SHEN, 1982 (fig. 1)

Host *Hippocampus trimaculatus* Leach;

Location intestine;

Locality Jieshi, Guangdong Province;

Infection 1 specimen from 1 of 2 hosts. Inst. Oceanol., Acad. Sinica, Qingdao

Description Body claviform, smooth, size 2.788 × 0.493. Rhynchus cone-shaped, 0.204 × 0.304, armed with a single row of irregular spines, 0.033—0.036 × 0.006.

Pharynx 0.102 × 0.119, situated near center of body. Intestinal sac globe-shaped, 0.255 in diameter.

Testes overlapped, anterior testis 0.289 × 0.204 posterior testis 0.238 × 0.221. Cirrus pouch 0.731 × 0.108. Internal seminal vesicle 0.136 × 0.102.

Ovary globe-shaped, 0.170 in diameter,situated before testes. Vitellaria follicle irregular, divided into two rows. 10 on the left side and 12 on the right side. Uterus looped anteriorly usually near posterior of rhynchus. Egg 18—21 × 12—15.

Excretory vesicle tubular.

Discussion Only 2 species of Telorhynchus have been recorded previously, namely *T. arripidis* Crowcroft, 1947 and *T. cociellae* Gu et Shen, 1976. This new species resembles *T. cociellae*, but differs from it in the body's large size; the spines of crown being numerous and irregularly arranged; the testes being overlapped in anterior and posterior; the uterus extending over vitellaria and near posterior end of phynchus; the eggs being smaller and the host is *Hippocampus trimaculatus* Leach.

SHEN, 1982

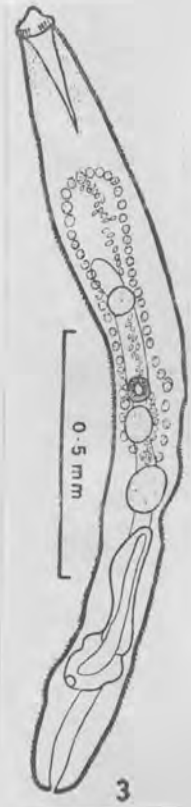
Telorhynchus scaberi ~~new species~~ ZAIDI AND KHAN, 1977

(Fig. 3)

Host: *Platycephalus scaber* (Day)
Location: Intestine
Locality: Fish Harbour Karachi (Arabian Sea)

The description is based on five specimens extracted from intestine of *Platycephalus scaber* (Day). Sixteen Specimens of this fish were examined at Karachi coast in January, 1968 but only one fish yielded a single worm.

The body of the worm is elongated with entire surface covered with minute spines. The rhynchus tapers posteriorly to form a cone like structure. There is a single crown of spines at the anterior end, which is interrupted in midventral line. The pharynx situated in the middle of the body, is rounded in outline. The intestine is short, tubular and directed anteriorly. The testes are located in the middle third of the body and are obliquely tandem. These are somewhat oval in outline, posterior testis is larger than the anterior one. The rounded ovary is pretesticular and is placed at the anterior border of the middle third of the body. The vitellaria are in the form of numerous follicles arranged in a single coloumn on each side and forming an arch in the middle at the anterior third of the body. Posteriorly, the vitellaria extend to the testicular level. The uterus forms a few loose loops between the anterior level of the vitellaria and the posterior testis. Excretory vesicle is tubular and reaches the level if intestine.



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Measurements (In Mm)

Body length	1.566-1.75
Body width	0.275-0.3
Rhynchus	0.285-0.29 × 0.076-0.1
Pharynx	0.048 × 0.048
Anterior testis	0.077-0.085 × 0.051-0.065
Posterior testis	0.094-9.085 × 0.71
Cirrus pouch	0.089 0.095 × 0.008-0.015
Ovary	0.056 0.066 × 0.056-006
Eggs	0.025-0.029 × 0.023-0.025

Discussion

The species under study is smaller in size than *Telorhynchus arripidis* Crowcroft, 1947 and *T. kahawai* Lebedev, 1968b but larger than *T. peacheyi* lebedev, 1968b. The rhynchus resembles with *T. arripidis* and *T. kahawai* in not being funnel shaped but differs in number of spines which is 18 against 15 in *T. arripidis* and 14 in *T. kahawai*. It differs from *T. peacheyi* in shape of rhynchus and the number of spines which is 20 in the *T. peacheyi*. It further differs from *T. kahawai* in the absence of prepharynx, in the position of testes, pharynx and in the size of eggs. It further differs from *T. arripidis* in the position of pharynx and ovary in relation to anterior testis. The species under study can further be distinguished from *T. peacheyi* in the position of pharynx, oral opening, intestine, ovary and testes. In view of above comparison it seems plausible to erect a new species for the material under study and the name *Telorhynchus scaberi* is proposed for it.

DAULAT ALI ZAIDI and DALER KHAN 1977